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An amphipod of the genus *Synurella* Wrzesniowski, 1877 (Crustacea, Amphipoda, Crangonyctidae) found in Baltic amber

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Abstract

Two amber pieces with amphipods were studied. One contained a species placed in the genus *Palaeogammarus* and a second species belonging to *Synurella*. The latter has an unsegmented urosome and shortened uropods 3, very similar to the specimen studied by Coleman [2004. Aquatic amphipods (Crustacea: Amphipoda: Crangonyctidae) in three pieces of Baltic amber. Org. Divers. Evol. 4, 119–122; Electronic Supplement at http://www.senckenberg.de/odes/04-03.htm], confirming the occurrence of the genus *Synurella* in Baltic amber. The systematic position of the amphipod within the second amber piece is unclear.

Keywords: Crustacea; Amphipoda; Baltic amber; Eocene; *Palaeogammarus*; *Synurella*

See also **Electronic Supplement** at: http://www.senckenberg.de/odes/06-05.htm

Introduction

Aquatic animals, such as amphipod crustaceans, do not appear in amber very often. In addition to the classical descriptions of *Palaeogammarus sambiensis* by Zaddach (1864) and *P. balticus* described by Lucks (1927), two more *Palaeogammarus* species have been found in recent years: *P. danicus* by Just (1974), and *P. polonicus* by Jazdzewski and Kulicka (2000a, 2002). Jazdzewski and Kulicka (2000b) also published a short note on a badly preserved amber piece containing several amphipod specimens probably belonging to the family Crangonyctidae.

While all these findings pertained to the genus *Palaeogammarus* only, Coleman and Myers (2001) published a description of a very unusual amphipod, *Niphargus groehni*. Extant niphargid amphipods normally occur in groundwaters, but some taxa also live in surface water. One of the latter kind was trapped in the resin in Eocene times. Coleman and Ruffo (2002) described another amber piece containing a niphargid amphipod. In a paper by Weitschat et al. (2002), the first amber corophioid amphipod was studied.

Coleman (2004), with some hesitation, described what appeared to be the first record of the genus *Synurella* in amber. As the anterior part of that animal resembled *Palaeogammarus* very much, he discussed the alternative possibility that what looked like fused urosomites, a typical feature of *Synurella* species, might be an artefact instead.

However, now a new piece of amber has turned up and is described herein, that contains two amphipods, one of them with *Synurella* characters, the other a typical *Palaeogammarus* species. A second amber piece with an amphipod of unclear systematic position is described briefly as well.

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Material and methods

Amber piece 1 belongs to Professor Dr. Max J. Kobbert (Münster), his catalogue number is T475. Amber piece 2 is from the private collection of Mr. Carsten Gröhn (Glinde), catalogued by him under No. 2773. Both pieces come from the amber mine of Jantarny (Palmnicken). They are from the Eocene period and about 40–54 million years old.

Drawings were made with a camera lucida on a Leica MZ 12. Digital images (Figs. 1 and 3) were made with a Sony Mavica camera with 3.3 megapixels directly through the ocular lens of a Wild M8 or Leica MZ 12 dissecting microscope. The micrographs in Fig. 1b, d and e were taken by M.J. Kobbert.

Length measurements were made along the dorsal outline of the animals, from the tip of the rostrum to the end of the urosome.

Line drawings were made following the method of Coleman (2003).

Results

Amber piece 1

(Figs. 1, 2b, c. For color version of Fig. 1 see Electronic Supplement at http://www.senckenberg.de/odes/06-05.htm)

This amber piece is approx. $40 \times 14 \times 4$ mm in size. Besides two amphipods, it contains two juvenile Araneae and three chironomid Diptera.

The amphipods are similar in size but differ in some characters, thus certainly do not belong to the same taxon.

Left specimen

The left specimen (in Figs. 1b and d, 2b and c) is 7.8 mm long and appears to be a member of *Palaeogammarus*. Details are very difficult to discern, as air layers under the cuticle cause reflections.

Head with short rostrum, no outline or trace of eyes visible, lateral cephalic lobe rounded. Coxae of pereopods 1–3 anteriorly straight, apically broadly rounded. Coxa 4 as wide as coxae 1–3 combined, with posteroproximal excavation.

Coxa 5 bilobed, anterior lobe shorter than posterior one, which is partly hidden by the basis; basis posteriorly rounded, posterior margin crenulate; ischium short; merus slender with oblique distal margin; carpus slightly longer than propodus, with setation on both sides and some long, slender setae apically; dactylus short and rather straight.

Pereopod 6 longest; basis of similar shape as in preceding leg; ischium short; merus distally oblique and rounded posteromarginally, with three groups of short setae posteromarginally and three groups on anterior margin, additionally long, slender setae on anterior and posterior distal margins; carpus and propodus subequal in length, both with two groups of slender, spine-like setae on anterior and three groups on posterior margin and on both sides of distal margin; dactylus short and straight.

Details of pereopod 7 not visible.

Pleon segments 1–3 (Figs. 1d, 2b and c) subequal in length; epimera 1 and 2 with ridge on lateral face, all epimera projecting in an acute tip posteroventrally.

Urosomite 1 longest, with row of spiniform setae posteromarginally; urosomite 2 with similar row of setae; urosomite 3 smooth.

Uropod 1 longest, peduncle longer than rami, rami subequal. Uropod 2 peduncle two-thirds length of uropod 1, rami shorter than peduncle. Uropod 3 peduncle shorter than lanceolate ramus, inner ramus scale-like (Fig. 2b and c). Telson with apical setation on both halves. It is not visible how deep the telson is cleft or notched.

Right specimen

The right specimen (Figs. 1b and 2a), length 5.7 mm, is in poor condition. The body is slightly twisted and visible from the left dorsolateral side. In contrast to the other specimen in the same amber piece, most of the cuticle is transparent, only the appendages are filled with air and crumpled up.

Head without rostrum, only a short protrusion of the anterodorsal margin is present; no trace of eyes; head anteroventrally rounded. Antenna 2 with rather short and wide first article; article 2 with subacute gland cone; article 3 subquadrate, half width of article 1; article 4 slender. Coxal plates of pereopods 1–3 subrectangular, with anteriorly and posteriorly rounded apices which bear some hair-like setae. Coxa 4 widest, with posterior lobe. Coxa 5 bilobate with posterior lobe longer. Coxa 6 anterior lobe narrower than posterior one, which is partially hidden behind basis. Coxa 7 small, rounded. Bases 5–7 wide, posteriorly rounded, with posteroventral lobe. Epimera 1–2 not visible, epimeral plate 3 subacutely produced posteroventrally. Urosome (Fig. 2a) rather short compared to pleon segment 3, unsegmented and void of setae. Uropod 1 peduncle only slightly longer than rami; rami subequal. Uropod 2 peduncle subequal in length to rami; rami subequal. Uropod 3 minute, directed posterodorsally, in contact with telson. Telson deeply cleft, with apical setae.

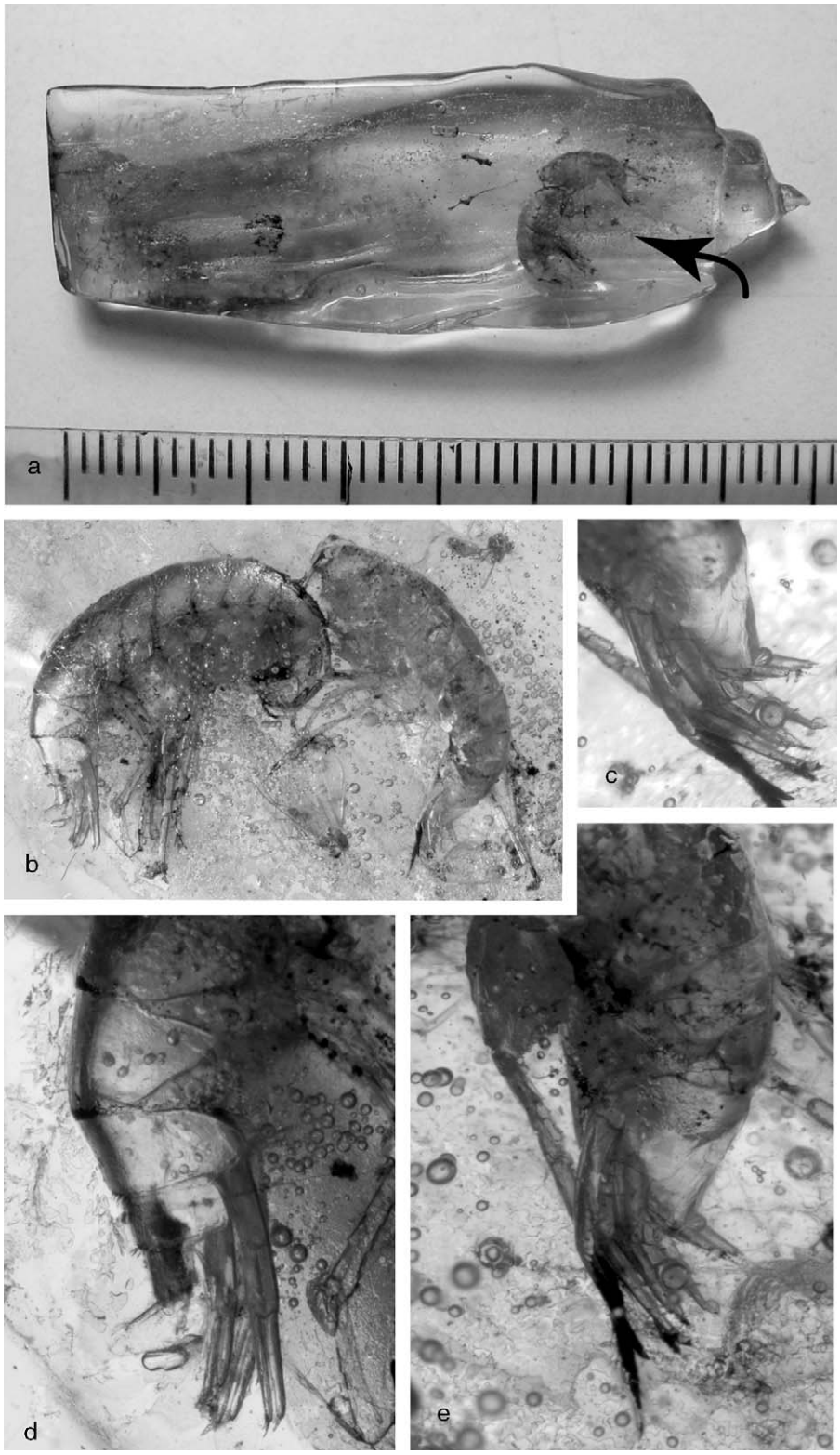

Fig. 1. Amber piece 1. (a) General view of the underside of the amber piece, arrow points to amphipod crustaceans. (b) Amphipods: left specimen *Palaeogammarus* sp., right specimen *Synurella* sp. (c) Detail of urosome of *Synurella* sp. (d) Pleonites 2–3 and urosome of *Palaeogammarus* sp. (e) Pleon and urosome of *Synurella* sp. Micrographs b, d and e taken by Prof. Kobbert.

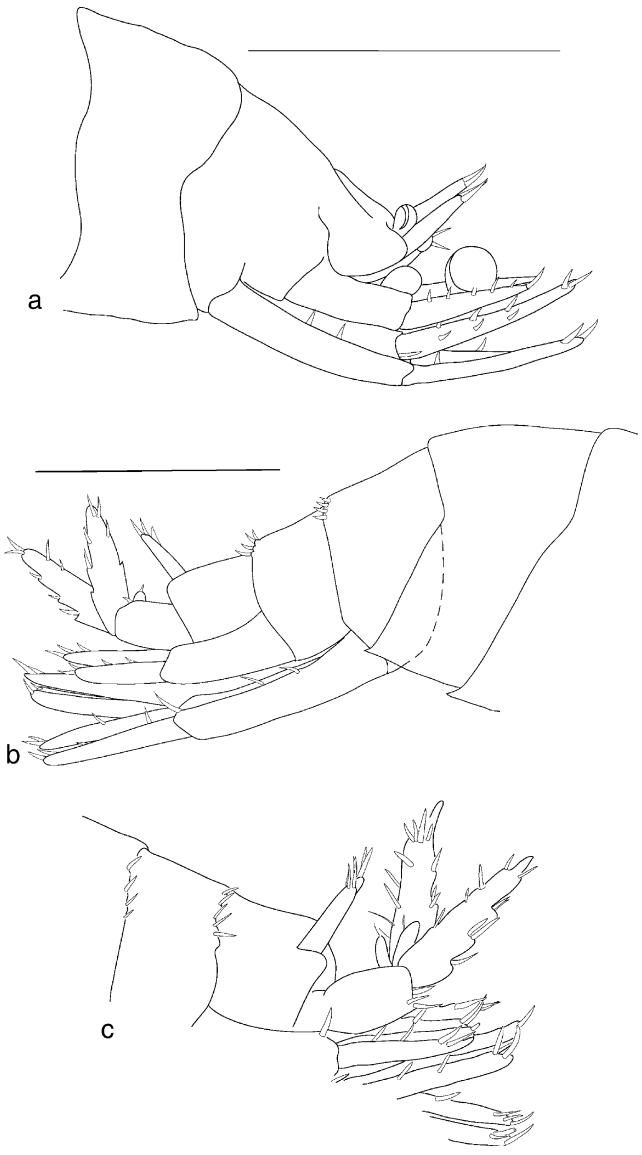

Fig. 2. Drawings of urosomes of amphipods from amber piece 1. (a) Urosome of *Synurella* sp., round bodies on uropod 2 and telson are air bubbles. (b) Right side of urosome of *Palaeogammarus* sp. with typical rows of spine-like setae on posterior margins of urosomites 1–2. (c) Left aspect of urosome of *Palaeogammarus* sp. Scale bars: 1 mm.

Amber piece 2

(Fig. 3. For color version see Electronic Supplement at http://www.senckenberg.de/odes/06-05.htm)

The second amber piece is approx. $42 \times 23 \times 9$ mm in size. Besides the amphipod crustacean it contains five Formicidae and one small coleopteran.

The amphipod specimen, 8.3 mm long, lies close to one of the ants, back to back. The amphipod is not well preserved, the right body side is fully hidden in cloudings. The left body side is visible from ventrolaterally. It appears that the animal is rather wide, the coxal plates from both body sides are far apart. The medial sides of the right body appendages are visible. Large air bubbles are covering the dorsal side of the urosome and the mouthpart region, which prevents the description of these parts.

Head massive, without any trace of eyes. Coxal plates of pereopods 1 and 2 anteriorly slightly excavate, distally wide and rounded. Coxa 3 somewhat longer and wider than preceding appendages. Coxa 4 widest, posteriorly lobate. Coxa 5 bilobate, anterior lobe smaller than posterior one.

In pereopods 5–7 of the left body side, merus to dactylus directed dorsally; pereopod 6 longest. On the right side, pereopods 5–7 stretched ventrally, all articles visible. For each of these appendages: basis wide, anteromarginally setose; ischium shortest, wider than long; merus posteriorly rounded, anteromarginally straight; carpus slender, subequal in length to propodus; with long setae antero- and posteromarginally.

Epimeral plates not visible.

Urosome 3-segmented, urosomite 2 shortest. Uropod 1 peduncle slender, about as long as rami, rami subequal, surpassing those of uropod 2; uropod 2 peduncle somewhat shorter than rami; inner ramus slightly shorter than outer one. Urosomite 3 ventral side slightly convex; uropod 3 present, not shortened, but details not visible. Telson not visible.

Discussion

Amber pieces containing several amphipods each have been found only twice before. Jazdzewski and Kulicka (2000b) found a piece with several amphipod specimens, presumably representing species of Crangonyctidae. Coleman (2004) described a piece with eight *Palaeogammarus* specimens.

Amber piece 1 studied herein is the third such finding, and the first containing specimens from different genera. The left animal in Fig. 1b very probably belongs to *Palaeogammarus*. Apart from the characteristic shape of coxae 1–4, it shows rows of short, spiniform setae on the posterior margins of urosomites 1–2 (Fig. 1d), a main diagnostic feature of the genus (Zaddach 1864; Jazdzewski and Kulicka 2002).

The other specimen in the same amber piece is less robust. Its anterior region resembles *Palaeogammarus*, but the urosome is quite different: (1) there is no segmentation (vs. clear segmental borders), (2) there is no trace of any dorsal spiniform setae (vs. rows of spine-like setae on the posterior margin of urosomites 1–2) and (3) uropod 3 is minute (vs. well developed); see Fig. 2b and c. This kind of urosome is characteristic for extant *Synurella* species (cf. Karaman 1974). An amber amphipod with a similar character combination was

Fig. 3. Amber piece 2. (a) General view, arrowhead points to amphipod; (b) and (c) aspects of systematically unplaced amphipod.

described by Coleman (2004). The specimen studied herein confirms the presence of *Synurella* in Baltic amber.

A precise determination of these amphipods is difficult, as not all of the systematically relevant characters are visible. Thus, no new species are described. The common practice of proposing new names for palaeontological material without firm morphological support and phylogenetic backing, simply on the basis of its age, is not followed here; the name *Synurella* is applied instead.

Amber piece 2 contains an amphipod which, due to poor preservation, cannot be classified. It bears some resemblance to *Palaeogammarus*. However, some traits are different: (1) the body of the animal appears to be wider, and (2) coxal plates 1–2 are excavated anteromarginally (vs. straight). Unfortunately, the dorsal ace of the urosome is not visible, which precludes checking for the presence of spine-like setae on urosomites 1–2.

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